Brian RODRICKS et al., S.N. 09/884,810   Dkt. 1166/68191
Page 3

Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) A digital imaging device comprising:

a top electrode layer;

a dielectric layer under the top electrode layer;

a sensor layer under the dielectric layer, comprising a photoconductive layer and a plurality of pixels, each pixel comprising a charge-collecting electrode;

a thin film transistor readout matrix connected to the charge-collecting electrodes; and

a variable power supply ~~set to provide~~ including a programmable controller,

wherein the variable power supply under programmed control of the programmable controller provides voltages between the top electrode layer and the readout matrix of 3.0 kV to 1.5 kV, said voltages establishing electrical fields in said sensor layer between a minimum electrical field E_c, at which a signal-to-noise ratio of the device is relatively high but the device operates below a saturation point, and a higher electrical field E, at which the signal-to-noise ratio may be lower but is at least 50, and

said programmable controller controls said variable power supply ~~being set~~ to provide a selected voltage between 3.0 kV and 1.5 kV ~~matching~~ suitable for attaining a desired signal-to-noise ratio for a selected object being imaged with said digital imaging device.

2. (original) The digital x-ray imaging device of claim 1 wherein the variable power supply comprises a programmable power supply.

Brian RODRICKS et al., S.N. 09/884,810   Dkt. 1166/68191
Page 4

3. (original) The digital x-ray imaging device of claim 1 wherein the photoconductive layer comprises an element selected from the group consisting of: selenium, lead iodide, thallium bromide, indium iodide, and cadmium telluride.

4. (original) The digital x-ray imaging device of claim 3 wherein the photoconductive layer is about 100 to about 1000 microns thick.

5. (original) The digital x-ray imaging device of claim 4 wherein the photoconductive layer comprises a layer of selenium about 500 microns thick.

Claims 6-8 (canceled).

9. (currently amended) A method for providing a broad dynamic range for a digital imaging device and controlling a signal-to-noise behavior of the device to maintain a signal-to-noise ratio of at least 50 and prevent saturation of the device, said device comprising a top electrode layer; a dielectric layer; a sensor layer comprising a photoconductive layer and a plurality of pixels, each pixel comprising a charge-collecting electrode; a thin film transistor readout matrix connected to the charge-collecting electrodes; and a programmable controller programmed to control a power supply for supplying to supply a selected voltage between the top electrode layer and the readout matrix; the method comprising varying the voltage between the top electrode and the readout matrix between 3.0 kV and 1.5 kV to provide signal-to-noise ratio of at least 50 over a range of exposures; said step of varying said voltage comprising varying the

Brian RODRICKS et al., S.N. 09/884,810   Dkt. 1166/68191
Page 5

voltage to establish electrical fields in said sensor between a minimum electrical field E_c, at

which the device has a relatively high signal-to-noise ratio but still remains below a saturation

point, and a higher electrical field E, at which the device has a signal-to-noise ratio that may be

lower but still is at least 50, and said varying further comprising ultimately setting said voltage at

a level within said range ~~matching~~ suitable for attaining a desired signal-to-noise ratio for an

object being examined with said device.

10. (original) The method of claim 9 further comprising using the method for non-

destructive testing of one or more objects.

11. (original) The method of claim 10 further comprising performing the non-destructive

testing on an object selected from the group consisting of: a printed circuit board, a wax casting,

a metal casting, a turbine blade, and a rocket cone.

12. (original) The method of claim 9 comprising varying the voltage in a range between

about 1.5 kV and about 3.0 kV.

13. (original) The method of claim 9 comprising using the digital imaging x-ray device

with a range of x-ray energies from about 10 KeV to about 10 MeV.

Claim 14 (canceled).

15. (currently amended) A method of operating a digital imaging device to image an

Brian RODRICKS et al., S.N. 09/884,810   Dkt. 1166/68191
Page 6

object in a non-destructive testing process, said digital imaging device comprising a top electrode

layer, a sensor layer comprising a photoconductive layer and a plurality of pixels, each pixel

comprising a charge-collecting electrode, a thin film transistor readout matrix connected to the

charge-collecting electrodes, and a_programmable controller programmed to control a power

supply ~~for supplying~~ to supply a selected voltage between the top electrode layer and the readout

matrix; the method comprising the steps of selectively varying the voltage between the top

electrode and the readout matrix to provide a signal-to-noise ratio of at least 50 over a range of

exposures and to select a voltage within said range that establishes an electrical field in said

sensor layer of at least a minimum value E_c and causes the digital imaging device to operate

below a digital electronic saturation point, said selected voltage ~~corresponding to~~ being suitable

for attaining a selected signal-to-noise behavior ~~in which the signal-to-noise ratio is at least 50~~

~~and matches~~ for a selected object being imaged with said device in said non-destructive testing

process.

16. (previously presented) A method as in claim 15 in which said voltage is in the range

of 1.5 kV and 3.0 kV.

17. (previously presented) A method as in claim 16 in which the signal-to-noise ratio

increases from below 200 to above 300 before said saturation point is reached as said voltage

changes from 3.0 kV to 1.5 kV.

18. (currently amended) A method as in claim 15 in which said selected voltage causes

said minimum electrical field to ~~corresponds~~ correspond to a signal-to-noise ratio in excess of

Brian RODRICKS et al., S.N. 09/884,810   Dkt. 1166/68191
Page 7

300.

19. (previously presented) A method as in claim 15 in which said selected signal-to-noise behavior is maintained at exposures in the range of 10KeV to 10 MeV.

20. (previously presented) A method as in claim 15 including the step of presetting a number of selected voltages for use with respective types of specimen.